

Appln. No. 10/076,499
Amdt. dated November 5, 2004
Official Action dated October 4, 2004

Amendments to the Specification:

Please replace lines 3 to 7 on page 1 with the following amended paragraph:

This application is a Continuation-In-Part application and claims priority on Canadian patent application serial number 2,351,903 filed on June 26, 2001 and International Patent Application Number PCT/CA01/00663 filed on May 8, 2001 which claims priority on Canadian patent application serial number 2,334,745 filed on February 13, 2001 and on United States serial number 09,566,728 which is now abandoned ~~which was allowed on November 2, 2004.~~

Please delete lines 8 to 19 on page 5.

Please replace lines 20 to 24 on page 5 with the following amended paragraph:

According to a ~~second~~ first aspect of the present invention, there is provided a process for preparation of nutritionally upgraded oilseed meals, which are protein and lipid-rich and have a reduced fibre content, and plant oils from oilseeds for use in fish or other non-human animal diets or human foods comprising the steps of:

Please replace lines 8 to 16 on page 6 with the following amended paragraph:

In a ~~[[third]]~~ second aspect of this invention, the above-described ~~second~~ first aspect can be modified as described herein to provide the ~~[[third]]~~ second process aspect. In particular, in the above ~~second~~ first aspect, the modifications involve the preparation of protein concentrates and lipid sources from co-processing of animal offal with oilseed for use in fish or other non-human animal feeds, wherein ~~[[the]]~~ a cold pressing step of said meat fraction or said mixture obtained from the first aspect above is carried out so as to substantially reduce the particle size of ~~[[said]]~~ the meat or ~~[[said]]~~ the mixture and to yield a high value human grade oil and a protein and lipid-rich meal with reduced fibre content. Thus, the ~~[[third]]~~ second aspect of the

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process comprises the further steps of:

Please delete lines 26 to 30 on page 6.

Please delete lines 1 to 31 on page 7.

Please delete lines 1 to 20 on page 8.

Please replace lines 24 to 26 on page 8 with the following amendment:

Further, there may also be included the step of drying the protein-rich fraction to reduce its moisture content to below about 10%. ~~Moreover, the moisture content can be between 6% to 9%.~~

Please replace lines 27 to 29 on page 8 with the following amendment:

In a ~~[[sixth]]~~ third aspect of the present invention, there is provided a process for preparation of oilseed protein concentrates from oilseed for use in fish or other non-human animal diets comprising the steps of:

Please replace lines 1 to 13 on page 9 with the following amendment:

- ~~subjecting the oilseed to heat treatment at a temperature and time sufficient under conditions selected to substantially deactivate, destroy or reduce [[the]]~~
~~concentration of at least some [[of the]] antinutritional factors components normally present in the oilseed to produce heat-treated seed~~ improve digestibility and reduce moisture content;

~~- dehulling the heat-treated seed to produce a meat fraction and a hull fraction;~~

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- ~~- cold pressing the meat fraction to yield a high value human grade oil and a moisture containing protein and lipid rich meal having a reduced fibre content;~~
- ~~- blending the protein and lipid rich meal with water and an antioxidant to produce a blended mixture;~~
- ~~- cooking the blended mixture under conditions selected to substantially improve protein digestibility to obtain a cooked mixture; and~~
- ~~- separating the cooked mixture into a stick water fraction, a moisture containing protein rich fraction, and an oil fraction.~~
- providing the source of unhydrolyzed animal product selected from animal offal, whole fish, fish by-catch and whole birds;
- cooking the mixture at a temperature of about 85 - 95°C for a time sufficient to improve protein digestibility and free the bound water present in the animal offal and facilitate the separation of protein from the lipid in the animal product and the oilseed.
- removing fluid from the mixture to obtain a pressed mixture during the cold pressing step; and,
- drying the pressed mixture at a low temperature for a time sufficient for the pressed mixture to reach a moisture content of about 7 - 10% to provide a protein concentrate.

Please delete lines 21 to 29 on page 9.

Please delete lines 1 to 4 on page 10.

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Please replace lines 7 to 27 on page 10 with the following amendment:

There may be also included the step of cooking ~~[[said]]~~ the mixture to obtain a cooked mixture prior to ~~[[said]]~~ the extracting step. In this embodiment, there may be further included the step of separating ~~[[said]]~~ the cooked mixture into a stickwater fraction, a moisture containing protein-rich fraction, and an animal feed grade oil. If desired, there also may be provided the step of drying the protein concentrate.

In another preferred embodiment, in any of the second above process aspects, desirably the heat treatment is a rapid heat treatment. The heat treatment may be carried out in one or more stages - for example, a two stage heat treatment can be employed where temperatures range from about 100°C to 115°C, and for treatment times ranging from 1.5 minutes to 30 minutes or more depending on the specific components being treated.

Particularly, suitable for any of the above ~~the second~~ process aspects, is where the oilseed is selected from the group consisting of canola, rape seed, soybeans, sunflower seed, flax seed, mustard seed, cotton seed, hemp and mixtures thereof. In the first process aspects ~~aspect~~, the oilseed may be selected from the group consisting of canola, sunflower seed, flax seed, mustard seed, and mixtures thereof. In the event the oilseed is a commercially available processed ground oilseed meal, the initial steps involving rapid heat-treatment and cold pressing are deleted.

Preferably ~~In the second aspect of the invention,~~ the animal offal may be selected from the group consisting of fish processing waste, whole fish, fish by-catch, squid offal, whole birds without feathers, beef offal, lamb offal and mixtures thereof. Particularly suitable ~~in the sixth aspect~~ is where the animal offal is a fish product or poultry or tail-end dehulled meal

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Please replace line 29 on page 11 with the following amendment:

The oilseed and the animal offal in any of the second above process aspects can be [[is]] mixed together in a ratio

Please replace lines 23 to 28 on page 12 with the following amendment:

The drying step in any of the second to sixth above process aspects may be performed at a temperature of between about 70°C to about 85°C. As mentioned above, the separation step may be carried out in a screw press, expeller press or decanter centrifuge, or any combination thereof. As an optional feature, the stickwater fraction obtained after separation may be further condensed to yield condensed solubles. The step of stabilizing the condensed solubles can be with an inorganic acid.

Please replace lines 16 to 17 on page 13 with the following amendment:

The extraction step may be carried out at least twice; the solvent that can be used [is] includes hexane.

Please replace lines 8 to 21 on page 14 with the following amendment:

A fourth process aspect provides for the preparation of nutritionally upgraded oilseed meals, which are protein and lipid-rich and have a reduced fibre content, and plant oils from oilseeds for use in fish or other non-human animal diets or human foods
the improvement comprising the steps of providing a source of oilseed; subjecting the oilseed to a drying step to obtain oilseed having a moisture content of less than 10% to thereby improve dehulling of the oilseed; dehulling the oilseed to provide a source of dehulled oilseed; providing a source of unhydrolyzed animal offal; blending the dehulled oilseed with the animal offal, and if required water together with an

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antioxidant, to form a mixture thereof; cooking the mixture under conditions selected to substantially improve protein digestibility, and substantially free cellular water and lipids present in the animal offal, as well as to facilitate separation of protein from the lipid in the animal offal and the oilseeds to obtain a cooked mixture; and separating the cooked mixture into a stickwater fraction, a moisture containing protein-rich fraction, and an animal feed grade oil fraction.

Please replace lines 22 to 29 on page 14 with the following amendment:

Preferably, in any of the above aspects, the oilseed is treated to dephytinize the oilseed. It is desirable in the first and seventh aspects there is provided the further step of extracting the protein rich fraction with a solvent. Desirably, in the second aspect there is included the further step of extracting the protein and lipid rich meals with the solvent. Preferably, the solvent includes hexane.

Please delete pages 15 to 19.

Please delete lines 1 to 21 on page 20.

Please delete lines 7 to 28 on page 21.

Please delete page 22.

Please delete lines 1 to 17 on page 23.

Please replace lines 18 to 27 on page 23 with the following amendment:

It will be understood that reference to the above described ~~products~~ aspects which are suitable for animal and fish feeds, refers to products which can be used by numerous types of species. For example, depending on the geographic location,

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fish feeds are used in fish farming operations for salmon, trout, tilapia, carp, catfish, sea bream and many other warm water as well as cold water species of commercial importance. In the case of animal feeds, conventional farming practices utilize such feeds for poultry, hogs, swine and cattle.

In further explanation of the various embodiments of ~~[[both]] the products and~~ process aspects of the present invention, the solvent used for extracting the mixture obtained from co-processing of oilseed and animal offal includes hexane or other compatible

Please replace lines 2 to 16 on page 24 with the following amendment.

In various embodiments of the process ~~and product~~ aspects of the present invention, the ash content in the protein concentrates can be regulated as desired by controlling the concentration of bone in the animal offal. Thus, the ash can be controlled by using a deboning step to obtain offal with the desired bone content. Bones in wet or dry form of different types of offal can be utilized, with varying degrees of bone coarseness. By way of example, the ash content can thus be controlled by controlling the amount of bone added to the mixture of oilseed and animal offal.

In the process ~~and product~~ aspects of the present invention, when referring to animal offal such as birds or chickens, it is to be understood that a most preferred embodiment is the use of offal without bird feathers.

In ~~[[both]] the process and product~~ aspects of the present invention, when using dehulled seeds, the term "dehulled" is intended to mean seeds which have substantially all of their hulls removed. However, in many cases, partially dehulled seeds can be employed as otherwise noted herein, and to this end, dehulled seeds are those which have had at least 55% of their hulls removed.

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Please delete lines 17 to 19 on page 24.